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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/919,998	08/02/2001	Tsunenobu Hori	P 0282798 U3-0140-TM	7177

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EXAMINER

KEANEY, ELIZABETH MARIE

ART UNIT PAPER NUMBER

2882

DATE MAILED: 07/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/919,998

Applicant(s)

HORI, TSUNENOBU

Examiner

Elizabeth Gemmell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1 and 3 is/are allowed.
- 6) ☒ Claim(s) 2, 4, 6, 7, 9 and 10 is/are rejected.
- 7) ☒ Claim(s) 2, 5 and 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 and 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Claim Objections

Claim 2 is objected to because of the following informalities:

- The limitation “mth” fails to be found within the claim it depends from.

Therefore, there is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 4,7,9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Katoh et al. (US Patent 5,465,022; hereinafter Katoh).

Katoh discloses, in figure 6 and throughout the disclosure, a spark plug comprising:

- A tubular housing (25);
- A central bar electrode (4) supported by the tubular housing with electrical insulation therebetween (20);

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- A stress releasing layer (19), arranged on a side of the one end of the tubular housing on an end surface of a base material which is at least one of the central bar electrode and the ground electrode;
- A chip (11), being arranged on the stress releasing layer and including a novel metal (column 7, line 41), for spark discharge through the central bar electrode and the ground electrode; and
- A weld portion (15; diffusion layer) formed between the base material and the chip with materials of the base material, wherein a linear expansion coefficient of the stress releasing layer is between those of the base material and the chip (column 7, lines 41+).

The Examiner notes the claim limitation "laser welding" is drawn to a process of manufacturing, which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent of showing an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katoh in view of Kanao et al. (US Patent 6,346,766; hereinafter Kanao).

Katoh discloses all the limitations as shown above.

However, Katoh fails to disclose the chip being made of more than 50% by weight of Ir.

Kanao discloses a chip being made of more than 50% by weight of Ir (column 3, lines 62+).

One of ordinary skill in the art at the time the invention was made would have been motivated to combine the spark plug disclosed by Katoh with that of a chip being made of more than 50% by weight of Ir because by using more than 50% by weight of Ir cracking and separation of the chip is reduced, therefore the life and efficiency of the spark plug is extended (column 2, lines 40+).

Allowable Subject Matter

Claims 1 and 3 are allowable over the prior art. And should the claim objection of claim 2 be overcome, it too would be allowable over the prior art.

Claims 5 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The best prior art discloses a spark plug comprising a weld portion between a base material and a chip, however it fails to teach or fairly suggest the weld portion including a first to nth weld layer formed by materials of the chip and base material to fix the chip to the base material, wherein the first to nth weld layers are successively arranged from a side of the base material in order of the first to nth weld layers in a distance increasing direction from the base material which is substantially perpendicular to the end surface, each of the first to nth weld layers has at least an overlap portion with a neighbor of the first to nth weld layers, a sum of a maximum first sectional area of the first layer and second sectional areas of the second to nth weld layers at the overlap portions is 1.4 times a third sectional area of the chip, the first, second and third sectional areas are along the end surface, wherein n is a natural number more than one, as claimed in claim 1. Claims 2 and 3 are allowable by virtue of their dependency.

The prior art also fails to teach or fairly suggest a spark plug comprising a chip and stress releasing layer welded to the base material, wherein the thickness (t) of the stress releasing layer is equal to or greater than 1.2mm and equal to or less than 1.6mm and $\alpha \geq (1.4-t)/2$, wherein α is a ratio of a maximum sectional area of the weld portion along the end surface to a sectional area of the chip along the end surface as claimed in claim 5.

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The prior art further fails to teach or fairly suggest a spark plug comprising a weld portion between a base material and a chip, wherein the weld portion includes first and second ring shape layers, the first layer is arranged between a portion of the end surface of the base material and the stress releasing layer to fix the stress releasing layer to the base material, the second ring shape layer is arranged between the chip and the stress releasing layer to fix the chip to the stress releasing layer as claimed in claim 8.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Gemmell whose telephone number is (703) 305-1937. The examiner can normally be reached on Monday-Thursday 6:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (703) 308-4858. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

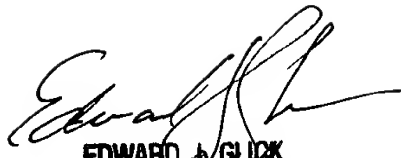
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emg

June 30, 2003


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